Day of Week Patterns of Heavy-Duty and Non-Heavy Duty Vehicle Activity At Weigh-in-Motion (WIM) Stations Relevant to the South Coast Air Basin During the Summer of 1997

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Goal

Differences in heavy-duty truck activity by day-of-week may be an important contributor to weekday-weekend differences in air pollution. The Weigh-in-Motion (WIM) network maintained by CALTRANS collects vehicle counts and identifies each vehicle's weight class. As a first step in analyzing day-of-week differences in heavy-duty truck activity, we examined WIM data for 10 locations in and around the South Coast Air Basin.

Data

Data from the WIM network were provided to us by Dr. Niemeir at U.C.-Davis. These data were collected during the summer of 1997 and examined by Dr. Niemeir as part of the overall SCOS97-NARSTO field study. The data set contained daily vehicle counts for each of 14 vehicle classes. Although hourly data would be more useful, we do not yet know whether such data will be available. Nevertheless, the daily data reveal potentially important differences in the traffic volumes by vehicle class.

Methodology

The WIM data contain separate counts for each of 14 vehicle classes. The sum of the counts for classes 8-14 represents heavy-duty trucks. Similarly, the sum of the counts for classes 1-7 represents non-heavy-duty vehicles. Several WIM stations had separate counts for eastbound and westbound or for northbound and southbound traffic. In such cases, the counts were combined. The table below lists the WIM stations and their locations.

Explanation of Graphs

Two sets of graphs are provided. In the first set, the vehicle counts are shown by day of week. One such graph is provided for each of 10 WIMS sites. In the second set of graphs, the vehicle counts are expressed as a percent of the Tuesday through Thursday average vehicle count and the calculations are carried out separately for Heavy-duty and Non-Heavy-Duty vehicles.

No characterization of uncertainty is included in the graphs at this time.

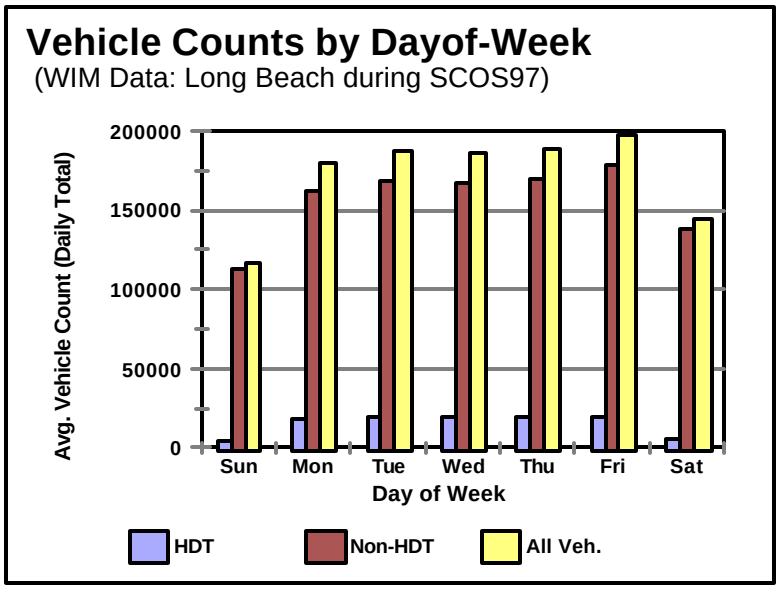
Results

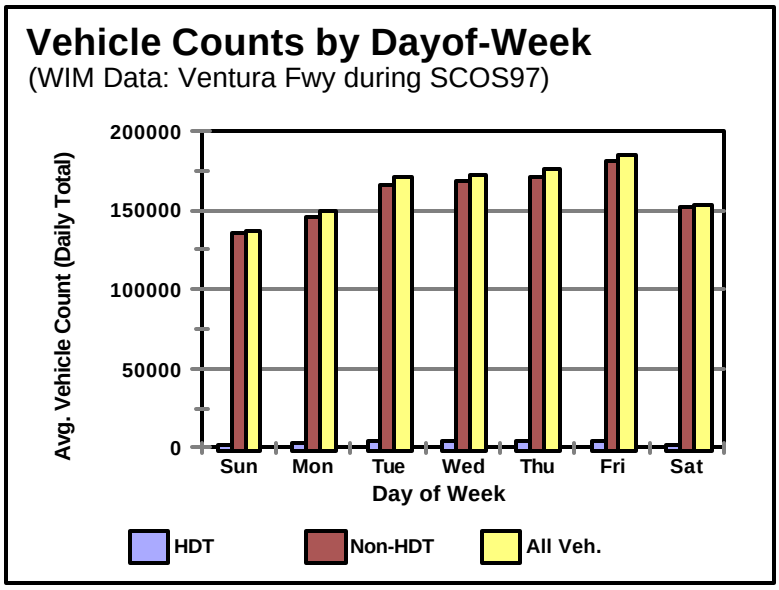
Two findings are offered at this time.

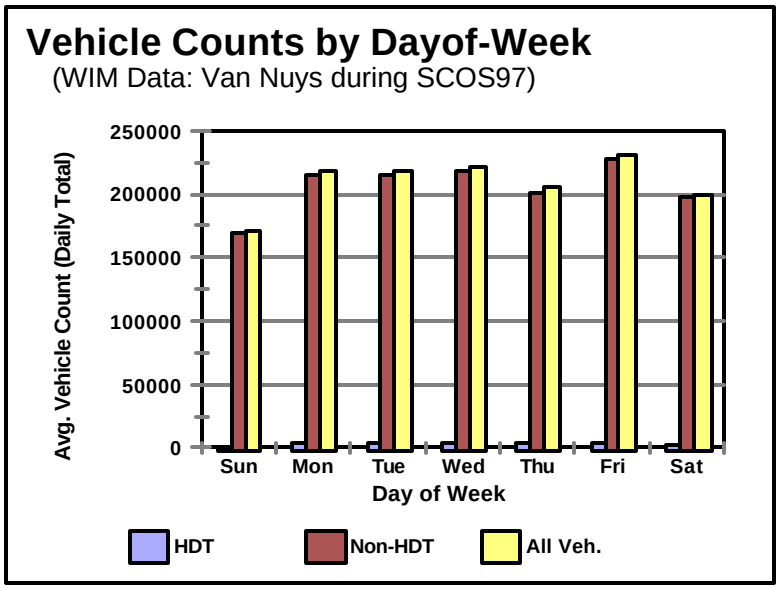
First, HDT activity is lower on weekends than on weekdays at all sites. Further, Sunday activity is lower than Saturday with the exception of Fontana. The percentage decreases on weekend days compared to weekdays are substantial.

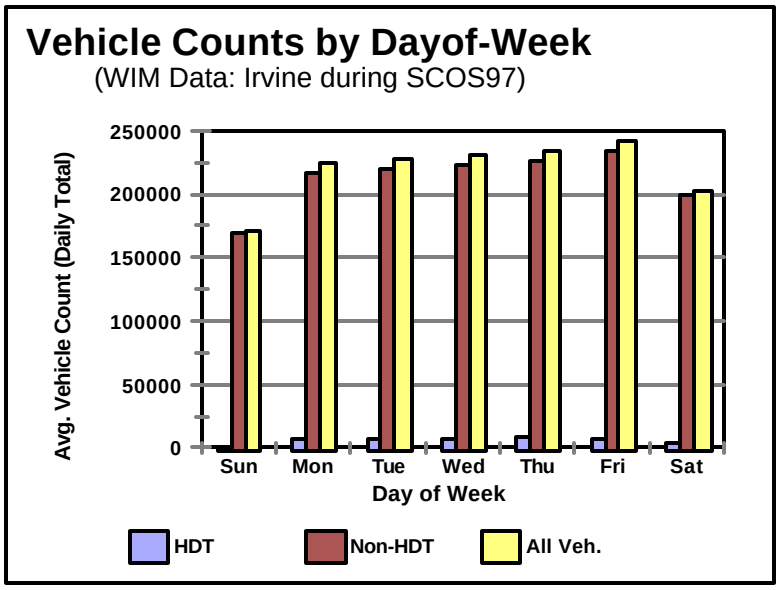
Second, the more central urban locations show the activity of non-heavy-duty vehicles decreasing on weekends. At some other locations, however, the activity of non-heavy-duty vehicles increases on weekend days and sometimes on Fridays. Recreational traffic and long-distance travel appear to play a role in some of the cases with greater weekend traffic volumes. This would be true of Fontana, Castaic, and Indio, for example.

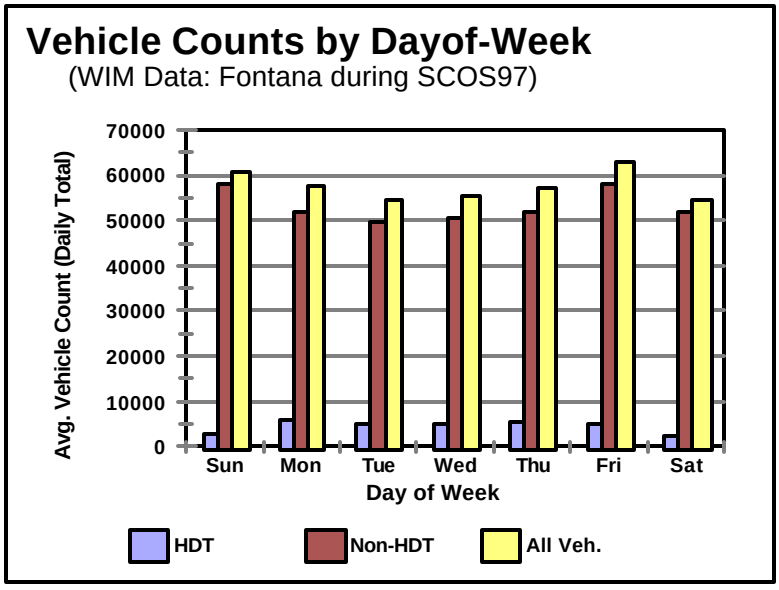
Station No.	Name	County	Fwy/Mile
5	INDIO	RIV	10-R59.4
6	NEWHALL (NB)	LA	5-44.6
8	VENTURA (SB)	LA	101-37.8
9	VENTURA (NB)	LA	101-37.8
12	VAN NUYS (SB)	LA	405-42.9
13	VAN NUYS (NB)	LA	405-42.9
14	SAN MARCOS	SD	78-10.7
15	IRVINE (SB)	ORA	5-25.8
16	IRVINE (NB)	ORA	5-25.8
23	EL CENTRO	IMP	8-40.0
25	NEWBERRY	SBD	40-28.9
26	CAMERON	SD	8-51.5
37	ELSINORE (SB)	RIV	15-21.6
38	ELSINORE (NB)	RIV	15-21.6
39	REDLANDS	SBD	30-31.7
40	COACHELLA	RIV	86-15.9
47	CASTAIC (SB)	LA	5-R56.1
48	CASTAIC (NB)	LA	5-R56.1
59	LONG BEACH (SB)	LA	710-11.5
60	LONG BEACH (NB)	LA	710-11.5
61	PERALTA (EB)	ORA	91-R11.9
62	PERALTA (WB)	ORA	91-R11.9
63	MURRIETA	RIV	215-R5.0
66	CALICO	SBD	15-R81.4
67	DEVORE	SBD	215-14.8
69	FONTANA (SB)	SBD	15-6.1
71	HINKLEY	SBD	58-19.7
101	MONTROSE (EB)	LA	2-7.5
102	MONTROSE (WB)	LA	2-7.5

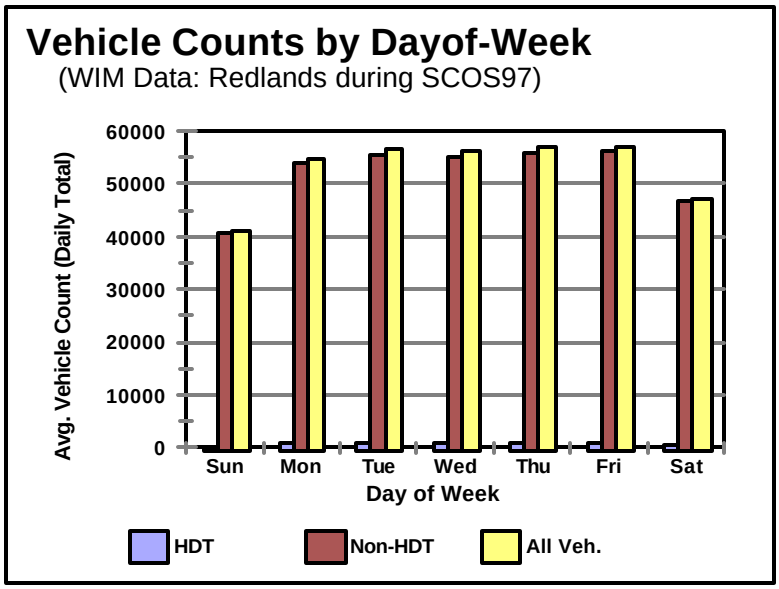

Vehicle Counts by Dayof-Week
(WIM Data: Long Beach during SCOS97)
Avg. Vehicle Count (Daily Total)
200000
150000
100000
50000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

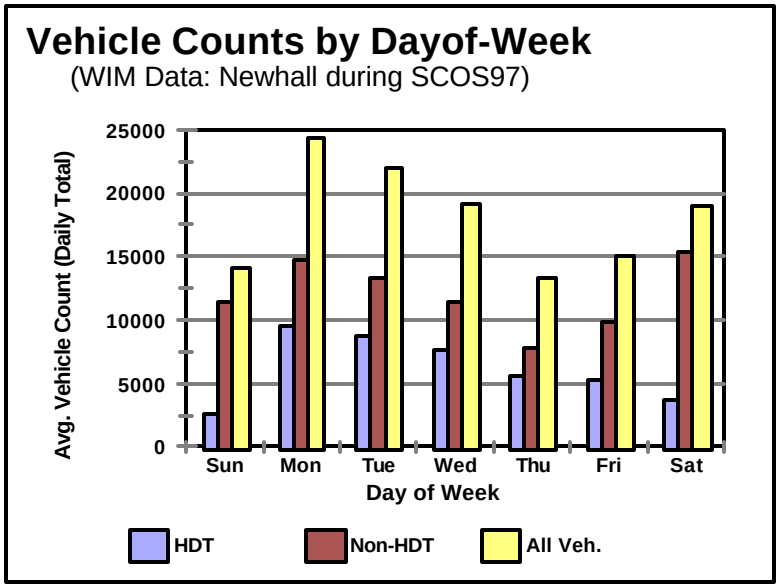

Vehicle Counts by Dayof-Week
(WIM Data: Ventura Fwy during SCOS97)
Avg. Vehicle Count (Daily Total)
200000
150000
100000
50000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

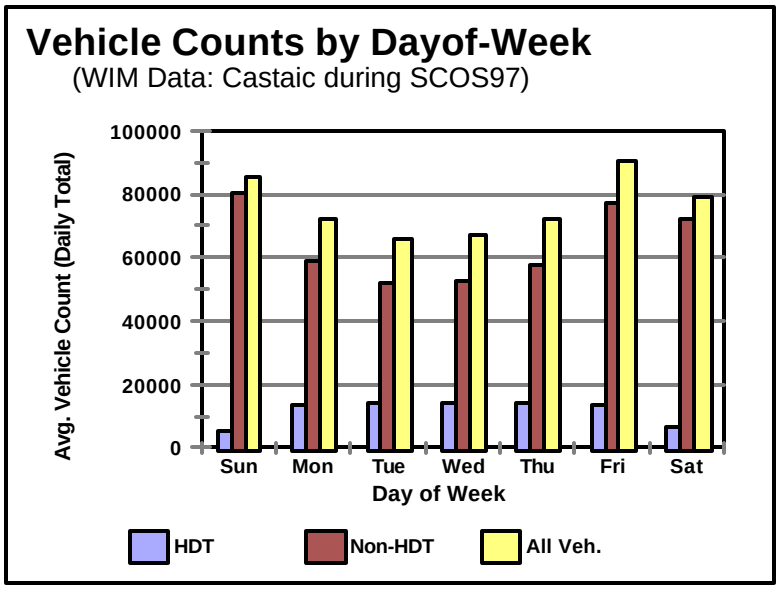

Vehicle Counts by Dayof-Week
(WIM Data: Van Nuys during SCOS97)
Avg. Vehicle Count (Daily Total)
250000
200000
150000
100000
50000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

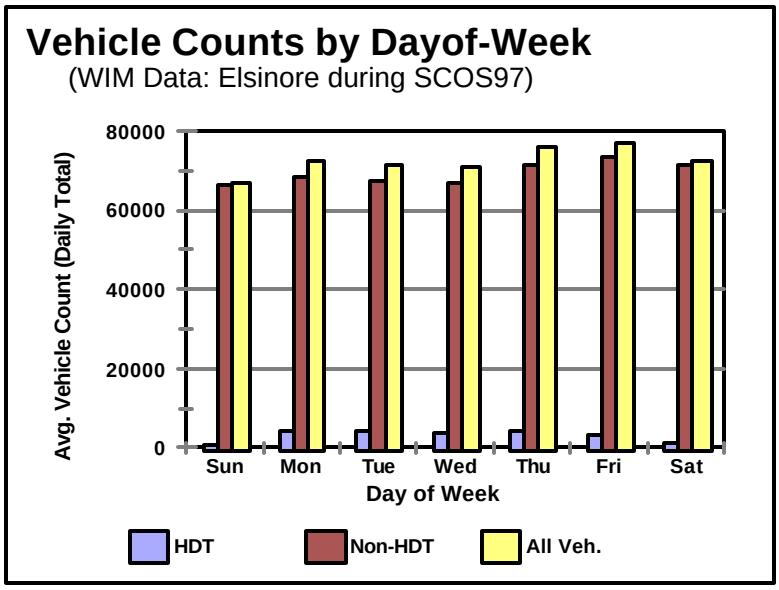

Vehicle Counts by Dayof-Week
(WIM Data: Irvine during SCOS97)
Avg. Vehicle Count (Daily Total)
250000
200000
150000
100000
50000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

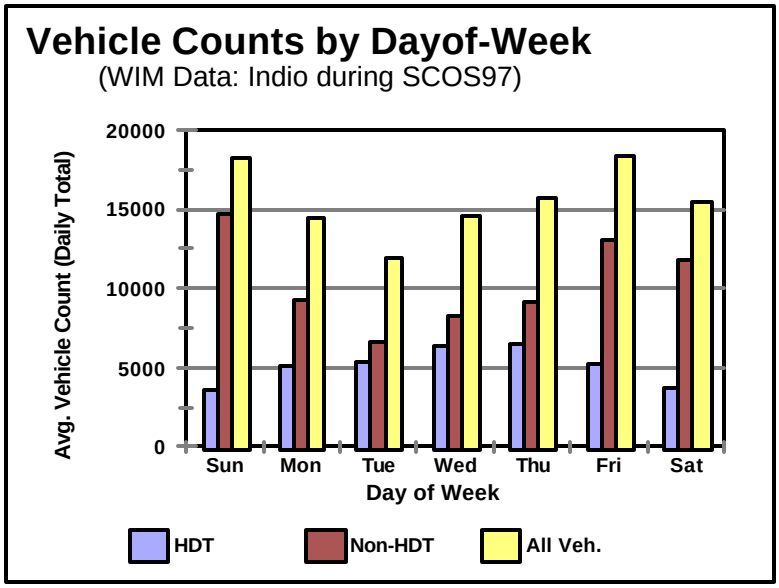

Vehicle Counts by Dayof-Week
(WIM Data: Fontana during SCOS97)
Avg. Vehicle Count (Daily Total)
70000
60000
50000
40000
30000
20000
10000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

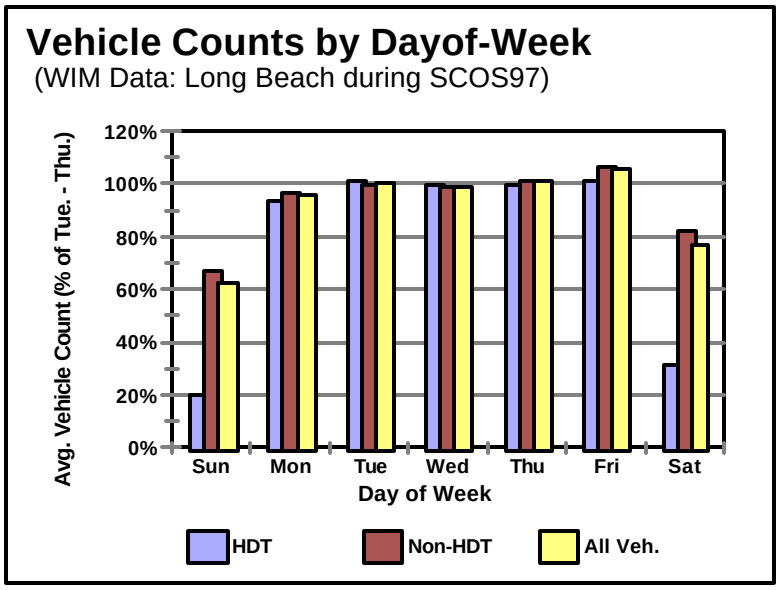

Vehicle Counts by Dayof-Week
(WIM Data: Redlands during SCOS97)
Avg. Vehicle Count (Daily Total)
60000
50000
40000
30000
20000
10000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

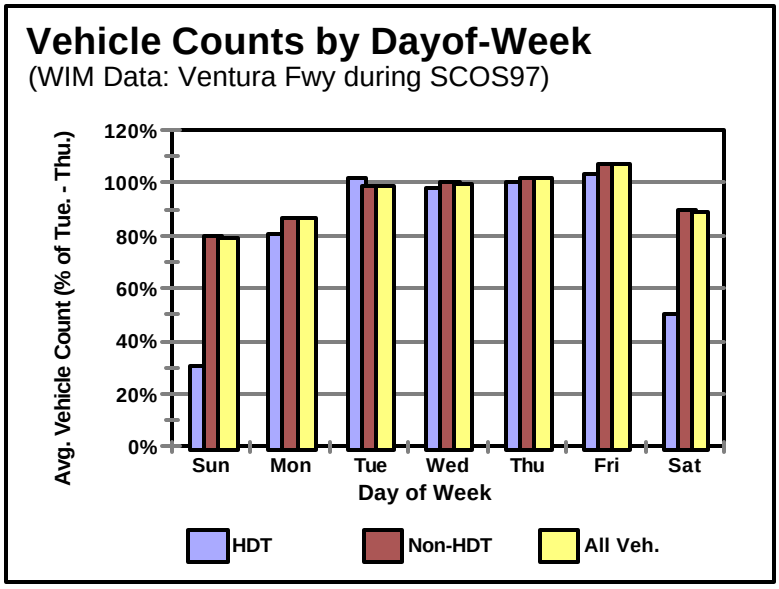

Vehicle Counts by Dayof-Week
(WIM Data: Newhall during SCOS97)
Avg. Vehicle Count (Daily Total)
25000
20000
15000
10000
5000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.

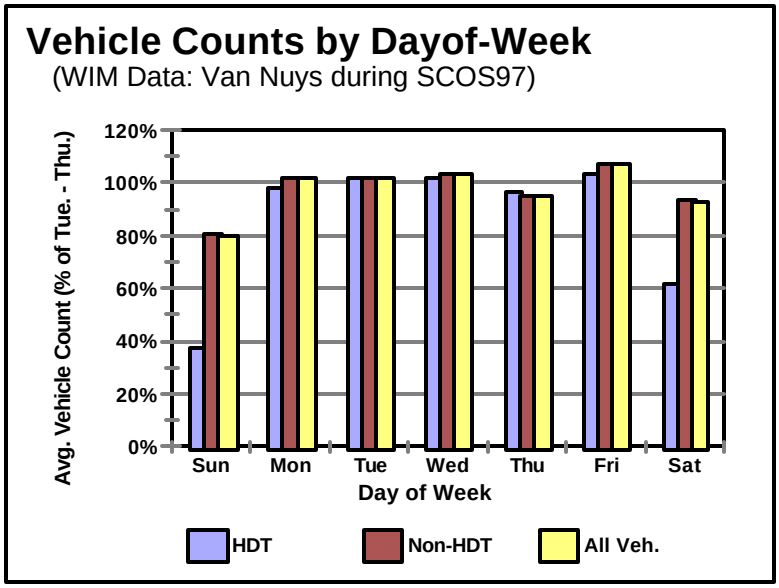

Vehicle Counts by Dayof-Week
(WIM Data: Castaic during SCOS97)
Avg. Vehicle Count (Daily Total)
100000
80000
60000
40000
20000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Elsinore during SCOS97)
Avg. Vehicle Count (Daily Total)
80000
60000
40000
20000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Indio during SCOS97)
Avg. Vehicle Count (Daily Total)
20000
15000
10000
5000
0
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Long Beach during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Ventura Fwy during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Van Nuys during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
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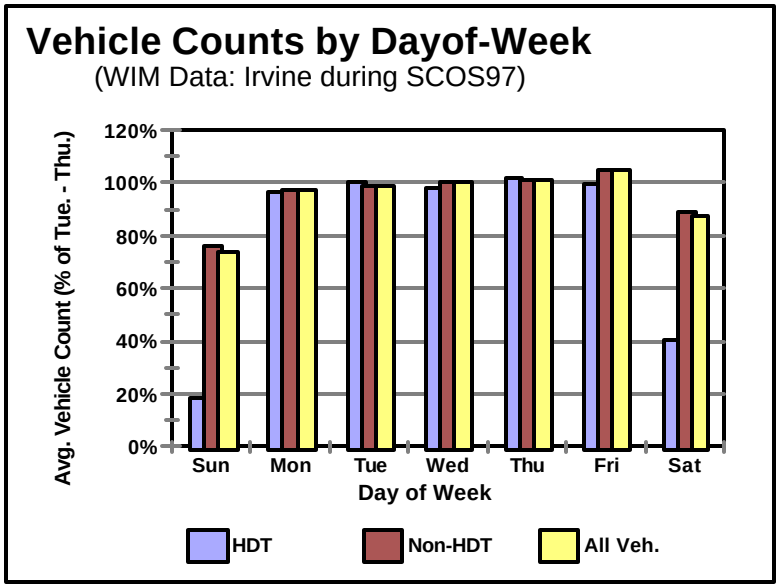
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Irvine during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
Tue
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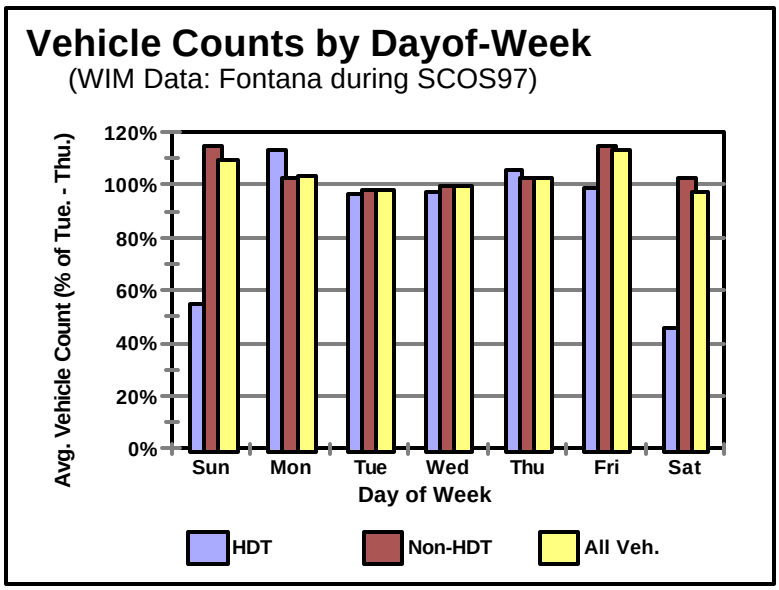
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Fontana during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
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Fri
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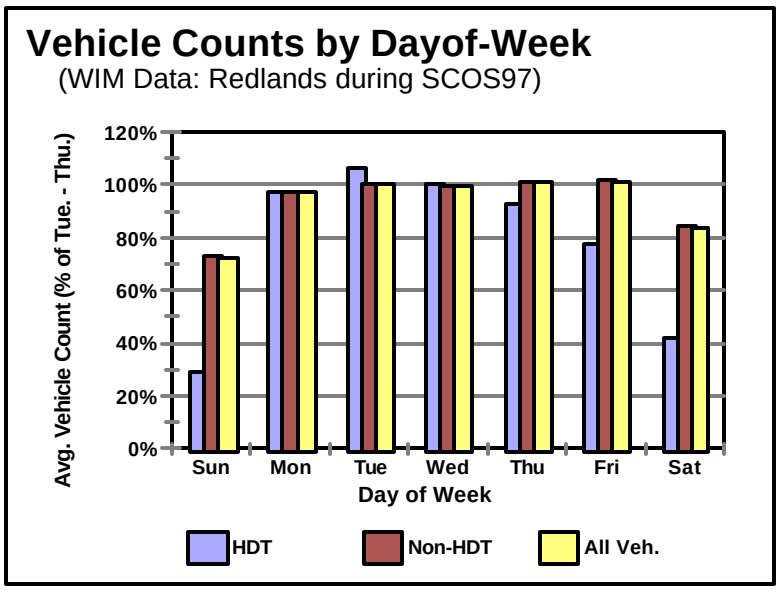
Day of Week
HDT
Non-HDT
All Veh.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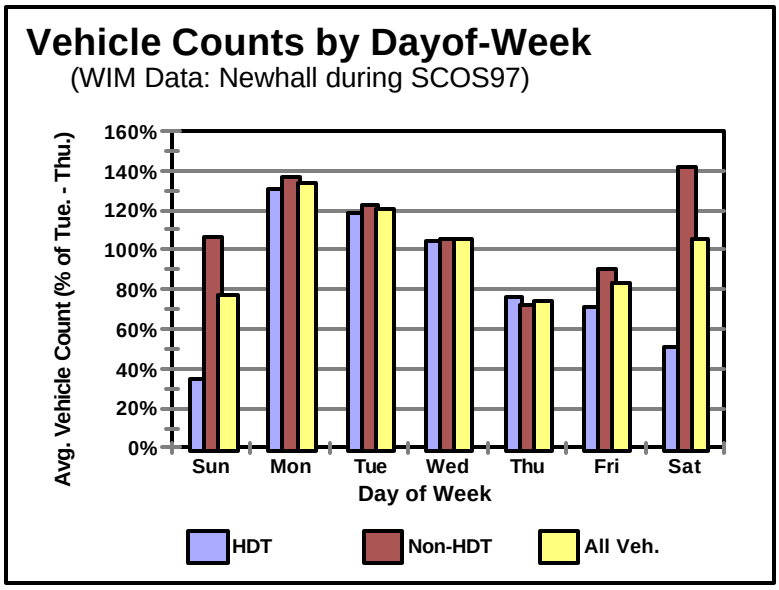
Vehicle Counts by Dayof-Week
(WIM Data: Newhall during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
160%
140%
120%
100%
80%
60%
40%
20%
0%
Sun
Mon
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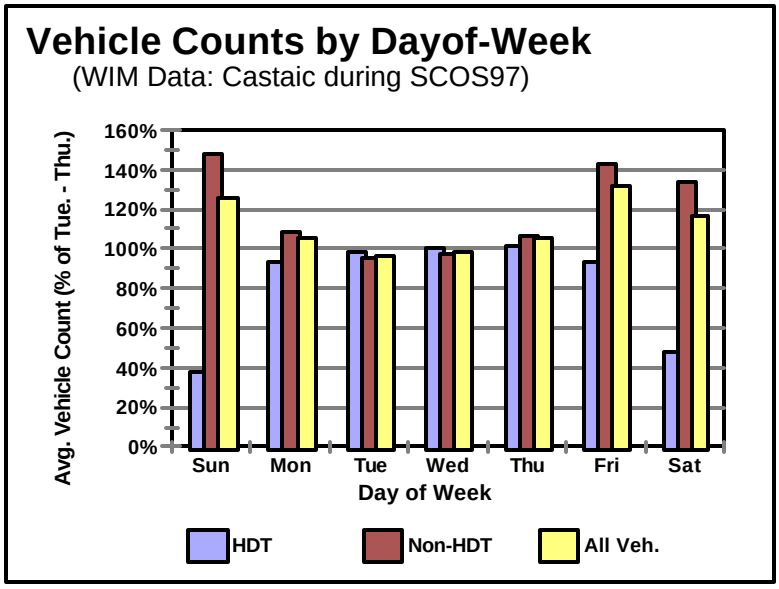
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.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(WIM Data: Castaic during SCOS97)
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120%
100%
80%
60%
40%
20%
0%
Sun
Mon
Tue
Wed
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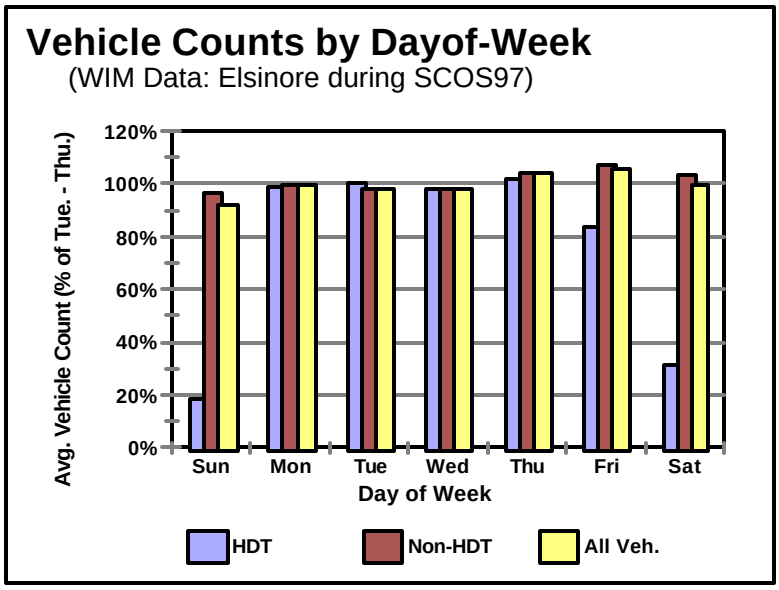
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Elsinore during SCOS97)
Avg. Vehicle Count (% of Tue. - Thu.)
120%
100%
80%
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40%
20%
0%
Sun
Mon
Tue
Wed
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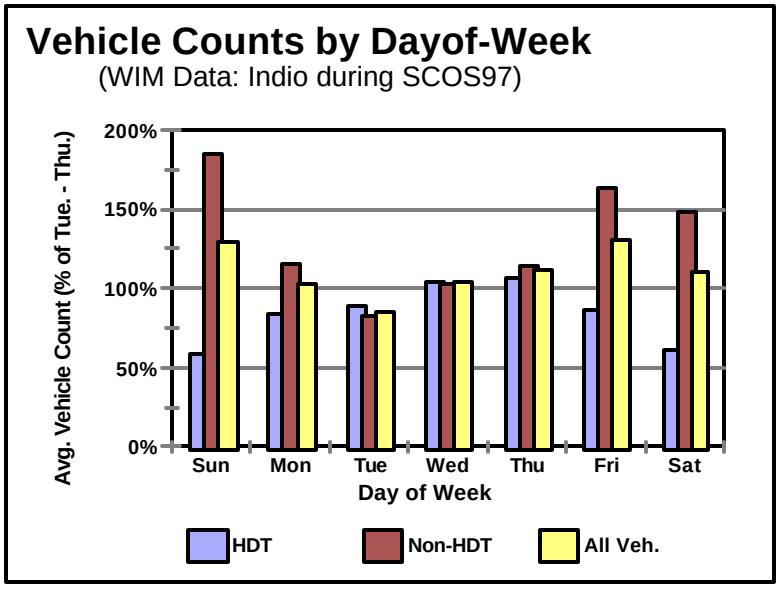
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.


Vehicle Counts by Dayof-Week
(WIM Data: Indio during SCOS97)
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200%
150%
100%
50%
0%
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Day of Week
HDT
Non-HDT
All Veh.